ARCADIAN

VOLUME 2 Number 7 May 19,1980

SANTA CLARA COMPUTER SWAP MEET at the Fairgrounds, San Jose on June 1. I will have Booth 102 and show off some ARCADIAN programs plus some new goodies, like a prototype of PROJECT 4. If you are in the area, stop by for a chat.

STATUS of various PROJECTS:

PROJECT 1 is the S-100 interface. Printed circuit boards are in the process of being etched, and when completed will be inspected, a couple wired up to ensure 'no glitches', and readied for distribution. Seems like August is still a good date.

PROJECT 4 has been upgraded somewhat. It will be a "hang-on" memory of 4K capacity. The memory box will fit onto the 50-pin connector and be supported by it. An external power supply (wall type) will plug into a socket(and keep the memory alive even if the Bally is turned off).

In addition to the RAM, there is a small amount of ROM that controls two sets of 8 input/output ports. All this can be accessed via the BASIC cartridge. Two programs will come with the kit - a utility program that allows machine code programming in hex, and the ability to dump from the extended memory to tape. The second will be a demonstration type with a number of experiments to show how the unit works, as well as a diagnostic routine for the PROJECT itself. Two switches are provided - to locate the extended memory (at 2000H or 6000H), and to protect the memory if desired.

Complete kit cost will be $130. Wired-up units will also be available as we received a nice response from ARCADIANs interested in doing this kind of work. (No negotiations have been made with any of them as yet.) The unit can be bought without the power supply ($10) or without the RAM (at $15/1K), resulting in a minimum cost of $60. All RAM is socket-mounted, and we expect to be able to supply ROM later on when there is enough utilization of the PROJECT to determine what should be included.

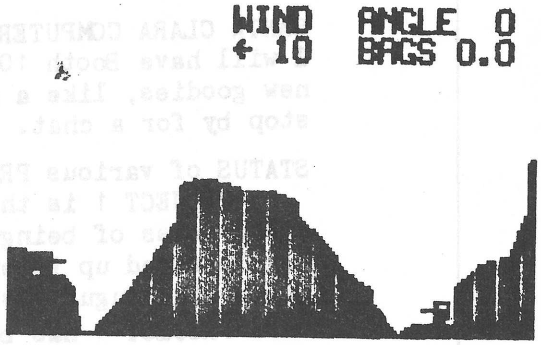
Early July is the expected date when the kits will be available. I will have an early unit at the 1 June Flea Market.

MUSIC Included in this issue is a paper written by George Moses, based on some fundamental research done by Brett Bilbray. Brett had sent me an interesting scheme to access the three-tone music system via the BASIC language, and I was considering how to present this, when George told me of the work he has done in smoothing over the rough edges and simplifying the technique. Pages 62 and 63 contain his inputs. I feel that this important work by Brett will enable us to add a little something to the programs that are developed in the future, with music old and new.

RF MODULATOR I just found a small box of these at a local electronic salvage shop. Not many available, and they are $20, working.

ARCADE FUTURE Bally is still discussing the sale of the Arcade machine, but names of possible purchasers are not available.

REVIEWS



ARTILLERY DUEL is an intriguing game by John Perkins. The machine sets up a random ground and adds two gun emplacements. As each player's turn is taken, he adjusts the knob for barrel elevation, moves the joystick to add or reduce the number of powder bags (by whole bags sideways; by tenths, back and forth). Then when ready, pull the trigger. There is gravity and a random wind. Anyway, the gun recoils and there goes the shell. There is an explosion when it lands. A gun is destroyed when less than half a gun remains (the repair crew can replace a gun barrel) The program usses all available space - don't enter lines 3 & 4. Be sure to exercise the joystick to see how the variables work.

Name of Program: ARTILLERY DUEL Cassette Name:
Description: Artillery duel between two players
Source: JOHN PERKINS (ARCADIAN V2 #7) Price —
Reviewed By: R.M. HOUSER Age: 42
Ratings : PD= 9 PP= 7 USF= 8 LC= 7 OC= 7 LI= 7 EV= 2 EU= 9 OV= 5 TP= 61 SZ=
Time to Play Variable For Ages 8 up # of Players 2

The above review scores are included this time to enable you to compare your thoughts about the game with the reviewer's so that you'll have an idea of his standards in future reviews.

STARFIRE by Tim Hays uses a user-defined subroutine to generate the enemy spacecraft, enemy refueling station, and a meteor/planet. The object is to fire a laser at those targets and avoid being hit by return laser fire. Many ideas used in this program can be used in more innovative programs.

Name of Program: STARFIRE Cassette Name:
Description: SHOOT DOWN ALIEN SHIPS WITHOUT GETTING HIT
Source: 3G BREES COMPUTING 456 GRANITE MONROVIA CA 91016 Price 6.50
Reviewed By: R.M. HOUSER Age: 42
Ratings : PD= 9 PP= 8 USF= 8 LC= 9 OC= 8 LI= 7 EV= 2 EU= 7 OV= 7 TP= 65 SZ= 1
Time to Play 5 MIN For Ages 8 up # of Players 1

BOOK REVIEWS In the last issue, I listed three books that owners would find of value. With the wide range of expertise that our subscribers have - from one end of the spectrum to the other - I feel that recommendations should be modified. In the reviews below, I supply a rating that extends from 0 to 100, where 0 indicates that the book would be useful to one who knows nothing about computers or their language and needs a lot of help. At the other end is 100, for the reader who is an expert. I have looked over two of the books mentioned: #21609 Z-80 Microprocessor, Vol I says that it requires no background, but it does, and it also moves too fast. In addition, it is written to be used with a specific computer, the SGS-ATES "Nanocomputer", so there are a number of items that pertain only, to that system, and the reader has to separate these. I would rate this book as a 40-80;
#21610, same title, Vol II tkaes off where the other ended, so rate it 80-100.

```
  3 .ARTILLERY DUEL
  4 .BY JOHN PERKINS
 10 :RETURN ;FOR A=0TO 9;@(A)=0;NEXT A
 20 CLEAR ;H=RND (50)-44;A=-80;T=RND (9);LINE A,H,4;I=H
 30 A=A+RND (10);H=H+RND (9)-T;IF H<-44H=-44;T=4
 40 IF H>-10T=6
 50 T=T+(T>5)b2-RND (3)+1;IF A>78A=79
 60 LINE A,H,1;IF A#79GOTO 30
 70 H=I;W=RND (51)-26
 80 FOR A=-80TO 79;LINE A,-44,4;IF PX(A,H)GOTO 120
 90 FOR Y=1TO 60;IF PX(A,H+Y)H=H+Y;GOTO 120
100 IF (PX(A,H-Y)=0)+(H-Y<-44)NEXT Y
110 H=H-Y
120 LINE A,H,1;NEXT A;S=RND (2)b2-3;G=RND (3)+2
130 FOR P=0TO 5STEP 5;X=RND (31)-75+(P=5)b120;FOR H=-44TO 20;IF PX(X,H)NEXT H
140 Y=H+RND (5)-3;IF Y<-40Y=-40
150 BOX X+(P=0)b4-2,Y+4,11,15,2;BOX X,Y,5,5,1;BOX X+(P=0)b2-1,Y-3,3,1,1
160 LINE X,Y,4;LINE X+(P=0)b12-6,Y,1;@(P+1)=X;@(P+2)=Y;NEXT P
170 P=(S=1)b5;C=Pc5+1
180 FOR N=1TO 11;BOX @(P+1),@(P+2)+1,3,1,3;NEXT N;NT=1
190 W=W+RND (9)-5;CX=-9;CY=40;PRINT "WIND";CX=-9;IF W TV=95+(W>0)b2
200 PRINT #3,ABS(W)
210 CX=Sb51-22;CY=40;A=@(P+4);PRINT "ANGLE",#3,A
220 CX=Sb51-22;B=@(P+3);PRINT "BAGS ",#1,Bc10,".",RM
230 IF TR(C)GOTO 350
240 K=(KN(C)+128)bS+(S#1)b255;IF ABS(K-E)<10GOTO 300
250 E=K;A=Kc15b5;@(P+4)=A;CY=40;CX=Sb51+8;PRINT #3,A
260 GOSUB 280;X=@(P+1);Y=@(P+2);LINE X-3bS,Y,4;BOX X-5bS,Y+4,5,9,2
270 K=Kc100;J=RM;LINE X-(3+Kc25)bS,Y+Jc25,1;GOTO 300
280 GOSUB 500+Ab2b(A<45)+(90-A)b2b(A>40);IF A>45K=Kc100+RMb100
290 RETURN
300 IF JX(C)=0IF JY(C)=0GOTO 230
310 B=B+JX(C)b10+JY(C);IF B<0B=0
320 IF B>99B=99
330 @(P+3)=B;CX=Sb51+8;CY=32
340 PRINT #1,Bc10,".",RM;GOTO 230
350 BOX 0,36,159,16,2;BOX @(P+1),@(P+2)+1,3,1,1
360 GOSUB 280;X=Kc100;Y=RM;R=9
370 X=-(XbBc100)bS+Wc2;Y=YbBc100
380 I=(@(P+1)-3bS)b10;J=@(P+2)b10;FOR N=15TO 1STEP -1;&(21)=32;&(23)=Nb16;NEXT
N
390 U=Ic10;V=Jc10;BOX U,V,1,1,3
400 K=U;L=V;Y=Y-G;I=I+X;J=J+Y;U=Ic10;V=Jc10;BOX K,L,1,1,3;BOX U,V,1,1,3;IF ABS(
U)>79BOX U,V,1,1,2;U=99;GOTO 430
410 IF V<-40V=-40;GOTO 430
420 IF (PX(U,V))+(V>20)GOTO 400
430 LINE U,V,4;FOR N=240TO 0STEP -16;&(23)=N;BC=RND (3)b13+86
440 LINE U+RND (R)-Rc2-1,V+RND (R)-Rc2,2;NEXT N
450 BC=7;T=0;E=(S#1)b5;U=@(E+1);V=@(E+2);FOR X=U-2TO U+2;FOR Y=V-2TO V+2;IF PX(
X,Y)T=T+1
460 IF T>13S=-S;GOTO 170
470 NEXT Y;NEXT X;IF R=9R=19;GOTO 430
480 @(P)=@(P)+1;PRINT #5,@(0),"    DESTROYED",@(5)
490 FOR N=0TO 3000;NEXT N;GOTO 20
500 K=9900;RETURN
510 K=9908;RETURN
520 K=9817;RETURN
530 K=9625;RETURN
540 K=9334;RETURN
550 K=9042;RETURN
560 K=8650;RETURN
570 K=8157;RETURN
580 K=7664;RETURN
590 K=7070;RETURN
```

SALVAGE BOARDS We have repaired four of these locally, and have found the following failures: 1 Z80 chip bad; 1 I/O chip bad; 3 ROM chips bad. Some soldering was poor. The boards apparently went through an initial attempt at repair, but when they continued to fail they were set aside. I would like to know the experiences of those who have been purchasing the boards, and especially if you develop a new use for them. Boards have been sent to those including checks, others who indicated interest had best send a check to get one of the remainder. I can't afford to maintain an inventory here so I expect my supply to be low.Price is $25. per.

MEMORY TUTORIAL 4

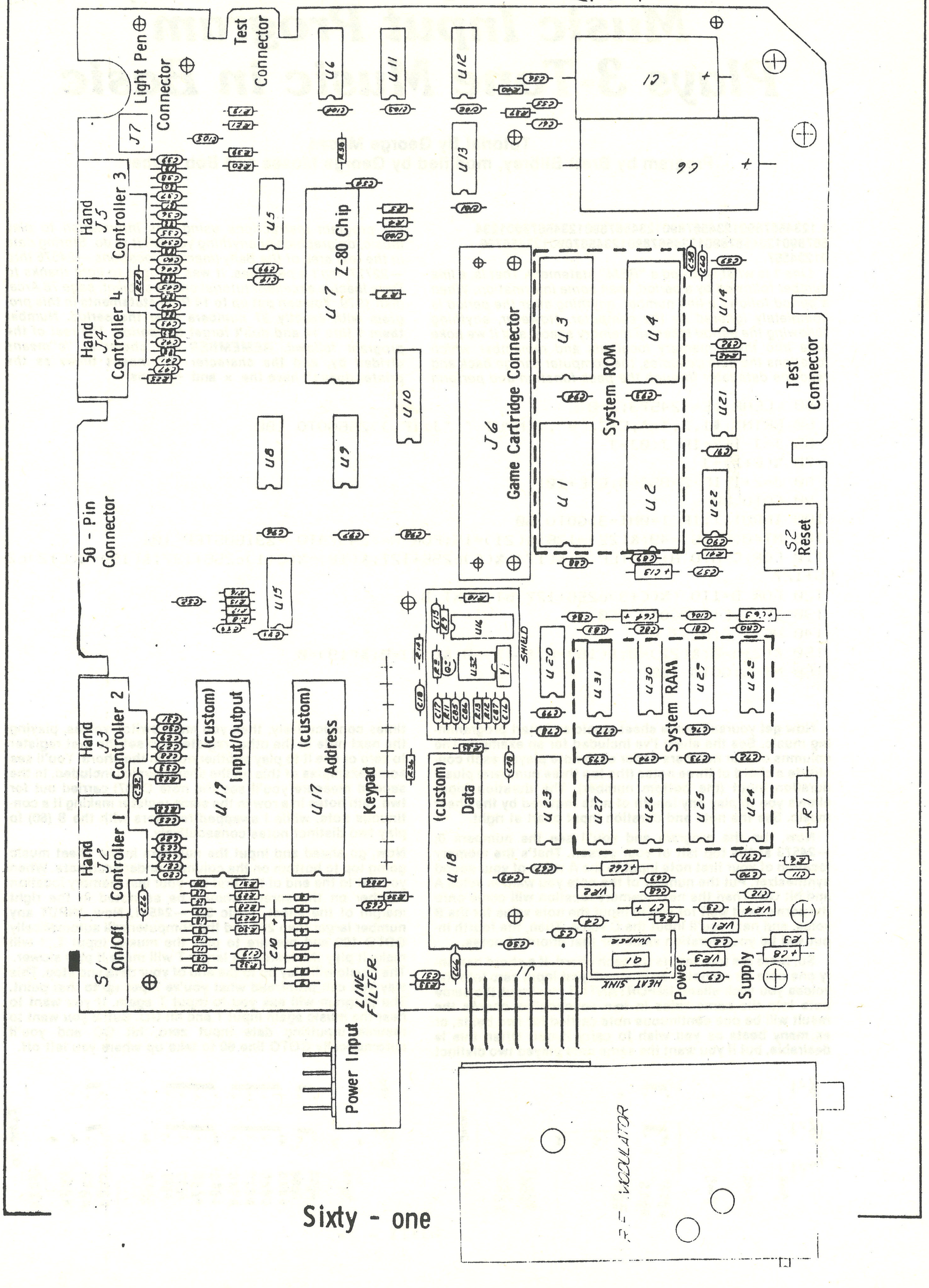
The basic operator is a clock, or frequency generator which,in this computer, puts out 1,789,000 pulses per second. The purpose of the clock is to enable things to take place at a known and constant rate.

The Z80 CPU 'talks' to its memory bank and the world through a set of 'lines' (connections) known as "READ", "WRITE", "ADDRESS", and "DATA". The memory bank has a set of power connections to keep it warm, and the general operation is that the CPU sends a signal consisting of the ADDRESS (locating a specific mail box in memory), then the DATA, and then the command to either READ or WRITE. The signal always has the same format and each signal has the same length and takes an equal amount of time to operate - per the clock.

The figure shows a layout of the major portions of the Bally printed circuit board. The memory areas of interest are enclosed by a dashed line, and entitled System RAM and System ROM. In addition, the Z-80 is identified as are the three custom chips. System ROM takes two physical forms: either the four chips U1 through U4 as shown in the diagram; or as one chip four times as large (in capacity) in location U2. The other three spaces are blank.

THE BASE OF 256 In order to save space, the addressing system uses eight on-off switches in parallel to create 256 possible combinations, as follows: Each switch can be either on or off (closed or open) and are so indicated by 1 or Ø . Therefore, one switch has two positions, or states. Two switches have four possible combinations of on and off, depicted by the convention ØØ Ø1 1Ø 11 . (both open, one open, the other open, both closed) This leads to the formula where the number of states is equal to 2^n , where n is the number of switches. For eight switches, these combinations total 256, because $2^8 = 256$. Since the first position is all open, or ØØØØØØØØ, then the last position is 11111111, all closed. The first is Ø in decimal notation, the last is 255. In hex they are ØØ$_H$ to FF$_H$. In speaking of a location as, for example, 6D$_H$, one means that the eight switches are set to Ø11Ø 1Ø11.

Each 'batch' of eight switches that can be set from Ø to 255 is called a PAGE, and the computer is built up of pages. Partial pages exist only rarely, and most computers have memory built in blocks of four pages. Four times 256 is 1024, commonly called 1K. So we have 4K,8K, 64K memories.


Light Pen Connector
Test Connector
J7
Hand Controller 3
J5
Hand Controller 4
J4
U6
U11
U12
U13
U5
Z-80 Chip
U7
U10
U8
U9
J6
Game Cartridge Connector
U3
U4
U1
U2
System ROM
U14
U21
U22
Test Connector
S2 Reset
C6
50 - Pin Connector
U15
U16
U32
Y1
SHIELD
U20
U31
U30
U29
U28
System RAM
U23
U27
U26
U25
U24
R1
Hand Controller 2
J3
Hand Controller 1
J2
S1
On/Off
U19
(custom) Input/Output
U17
(custom) Address
Keypad
U18
(custom) Data
LINE FILTER
Power Input
J1
HEAT SINK
Q1
Jumper
VR1
VR2
VR3
VR4
Power Supply
RF MODULATOR

Music Input Program Plays 3-Tone Music in Basic

Tutorial By George Moses
Program by Brett Bilbrey, modified by George Moses and Bob Weber

1.1234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567

Line 1 is what is called a "REM" statement. That is, a line number followed by a period, then some information. When a period follows a line number, anything after the period is completely ignored by the computer. However, anything following the period takes up memory space, and if we poke data into these memory locations and remember which locations the data occupies, the computer can go back and read the data later through the peek function and perform the program instructions using this information to play music, do graphics or anything you tell it to do. Storing data in the text area of the Bally (memory locations —24576 thru —22777) isn't a new idea. It was brought to light thanks to Dave Ibach's excellent tutorial on the subject, page 78 Arcadian 1979. ***You can put up to 14 REM statements in this program with exactly 97 numbers after the period. Number them 1 thru 14 and don't forget the period. The rest of the program follows. REMEMBER the character "c"means divided by, and the character "b" means times as the printer doesn't have the × and ÷ signs.***

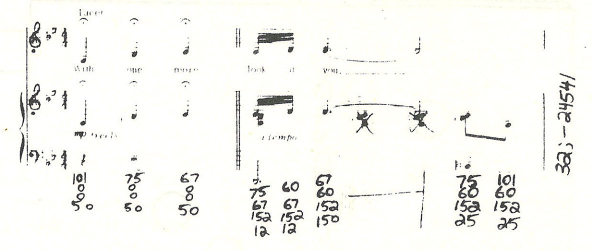
```
  50 CLEAR ;E=-24573;Z=0
  60 PRINT #1,Z,":",E+Z,"=",;INPUT " "J;IF J>256GOTO 100
  65 J=J-127;IF J<0J=J-1
  70 %(E+Z)=J
  80 Z=Z+1;IF Z>95Z=0;E=E+101
  90 GOTO 60
 100 INPUT T;IF T=0NT=3;GOTO 60
 105 NT=0;&(16)=49;&(22)=136;&(21)=15;FOR A=-24574TO -23160STEP 101
 110 FOR C=ATO A+92STEP 4;&(17)=%(C)c256+127;&(18)=%(C+1)c256+127;&(19)=%(C+2)c2
56+127
 120 FOR D=1TO (%(C+3)c256+127)bT;NEXT D
 130 IF C>E+Z-8GOTO 150
 140 NEXT C;NEXT A
 150 &(21)=0;&(22)=0;&(16)=0;&(17)=0;&(18)=0;&(19)=0
 160 NT=3;GOTO 100
```

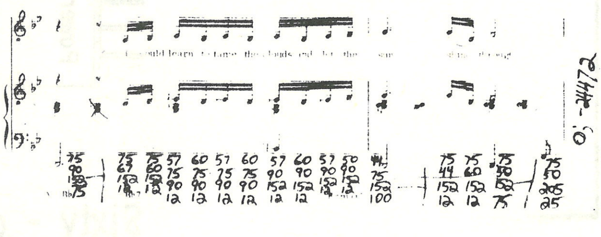
Now get yourself some sheet music and start programming music. See the sheet I've included for an example. The columns of four numbers under each note played each constitute a chord of three notes (the top three numbers) plus a duration input (the bottom number). The duration input allows you to play any length of note required by the sheet music. See the note and duration input chart at right.

Now, run the program and you'll see the numbers 0; —24573 at the top left of your screen. That's the memory location of your first note input to the A voice of your sound synthesizer. Put the number of the note you want in voice A and hit GO. Then the next memory location will come onto the screen and wait for you to input the note value for the B voice, and next you'll input the C voice. Then, the fourth input will be your duration value for that chord of notes.

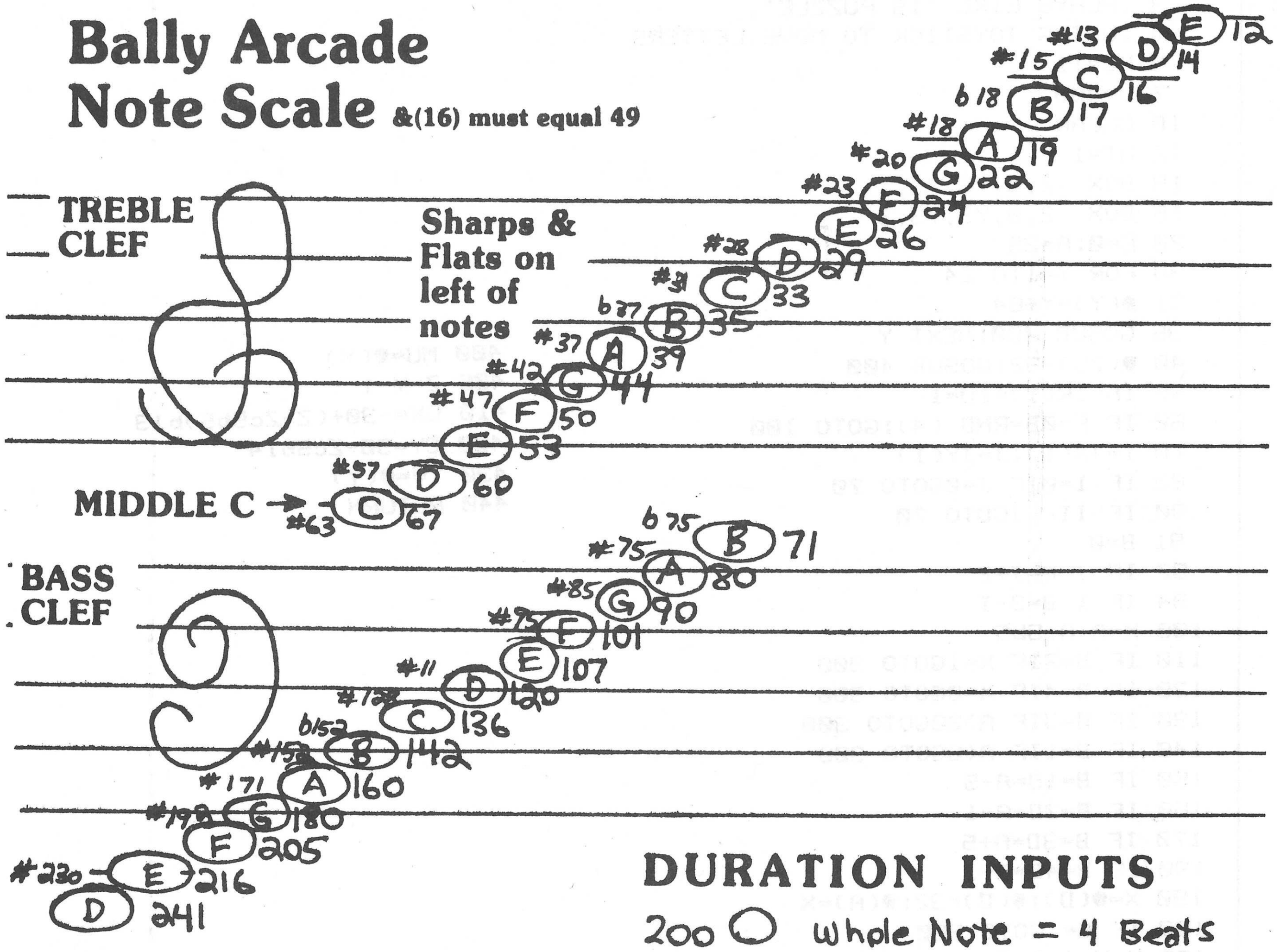
So, there are four inputs for each chord. If a chord has only one note (or no notes as in a rest) just input zero into the voices you wish silent. IMPORTANT! If you input the same note into the same voice in two consecutive chords the result will be one continuous note carried for two beats, or as many beats as you wish to carry it out. Often this is desirable, but if you want the same note played two distinct times consecutively, then you must switch voices, playing the next note in the other register and set the first register to zero or use it to play another note in the chord. You'll see some examples of this on the sheet music I included. In the second measure you'll see the note C (67) carried out for two 16th notes in a row in the same register making it a continuous note, while I swapped registers with the B (60) to play two distinct notes consecutively.

Now, go ahead and input the numbers in the sheet music going top to bottom on the columns under each note. When you get to the end of the first bar your last memory location number on the screen should be as noted in the right margin of the sheet music 32; —24541. Now, INPUT any number larger than 256 and the computer will automatically GOTO 100 and prepare to play the music. Input T. 1 will make it play the fastest. A larger T will make it play slower. The music will play up to the end of your data and stop. This way you can proofread what you've input up to that point. The program will ask you to input T again. If you want to hear the music again input T and hit GO. But, if you want to resume inputting data input zero, hit GO and you'll automatically GOTO line 60 to take up where you left off.





Bally Arcade Note Scale &(16) must equal 49



DURATION INPUTS

200	𝅝	Whole Note = 4 Beats
100	𝅗𝅥	Half Note = 2 Beats
50	♩	Quarter Note = 1 Beat
25	♫	Eighth Note = 1/2 Beat
12	♬	Sixteenth Note = 1/4 Beat
6	♬	Thirty Second = 1/8 Beat

What about correcting mistakes? Simple. Just input the memory location of the beginning of that bar and input the data again. Say the first bar was wrong. Just HALT the program and type in the beginning memory data like this: Z=0; E=—24573—Z;GOTO 60 and this will get you back to the beginning of the first bar. For this purpose it's advisable to put the last memory readout at the right margin of each bar as per the example included. The numbers at the end of the first bar would get you set up at the beginning of bar 2 if you were to have a glitch there and needed to input the correct data. It is IMPORTANT to proof-listen to each bar before going on because you cannot input corrections in the middle of a song. You can start in the middle, but you have to keep inputting data till the end. The Bally looks at two bytes of memory at a time when inputting and while you correct one note, you're creating a glitch in one of the following notes, so you have to keep rolling to cover up the whole performance perfectly.

After you input your last note you should alter line 130 to read the ending location to stop the music at the end of data. If you don't you'll get some awful sounds when the computer runs out of notes to play. Just halt the program and ask the computer to PRINT E+Z-8. The answer will be a nvgative number. Take this number and put it in line 130 in place of the E and Z-8 variables and you have a complete program.

Another line you may want to change for convenience is line 100. Once you decide the best value of T for that song, just set T equal to that number permanently in the line. Also you may want to do the following with line 160 FOR M=1 TO 2000; NEXT M; GOTO 100. This will give you a five second delay at the end of the song and automatically begin the music again.

To save on tape with automatic RUN just get your recorder ready, then type in *NT=1;CLEAR;:PRINT;LIST; PRINT":RETURN;CLEAR;NT=0;GOTO 100*
Turn on your tape recorder, then hit GO and watch it list. The listing of the REM statements will be mostly question marks, but don't worry. The computer understands what they are through the peek command in the program. Any questions or new discoveries about this music program will be welcomed by all of us of the Bally Users' Group of Michigan at 110 E. North St., Brighton, Michigan 48116.

```
  1 . PUZZLE
  2 .BY BOB WISEMAN
  3 .PLAYS LIKE "15 PUZZLE",
  4 .USING JOYSTICK TO MOVE LETTERS
  5 FC=11
  7 V=400
 10 CLEAR
 12 NT=1
 15 BOX -2,0,75,75,1
 16 BOX -2,0,73,73,3
 20 E=0;A=25
 30 FOR Y=1TO 24
 31 @(Y)=Y+64
 35 GOSUB 400;NEXT Y
 40 @(25)=32;GOSUB 400
 50 IF TR(1)=1U=1
 60 IF E=0B=RND (4);GOTO 100
 70 I=JX(1);J=JY(1)
 80 IF I=0IF J=0GOTO 70
 90 IF IIF JGOTO 70
 91 B=0
 92 IF J B=J+2
 94 IF I B=3-I
100 X=A-Ac5b5
110 IF B=2IF X=1GOTO 300
120 IF B=4IF X=0GOTO 300
130 IF B=3IF A>20GOTO 300
140 IF B=1IF A<6GOTO 300
150 IF B=1D=A-5
160 IF B=2D=A-1
170 IF B=3D=A+5
180 IF B=4D=A+1
190 X=@(D);@(D)=32;@(A)=X
192 IF E=1GOTO 200
193 V=V-1;A=D
194 IF V<200FOR Y=1TO 25;GOSUB 400;NEXT Y;E=1;GOTO 50
196 GOTO 50
200 Y=D;GOSUB 400
210 Y=A;GOSUB 400
220 A=D
221 IF U=0GOTO 50
222 U=0
225 Y=0
230 FOR X=1TO 25
235 IF X=AGOTO 250
240 IF @(X)<YGOTO 50
245 Y=@(X)
250 NEXT X
260 FOR X=1TO 25
270 MU=X;NEXT X
280 GOTO 5
300 IF E=0GOTO 50
302 FOR X=1TO 5
305 MU=X;NEXT X
310 GOTO 50
```

```
400 MU=@(Y)
405 Z=Y-1
410 CX=-30+(Z-Zc5b5)b13
420 CY=30-Zc5b14
430 TV=@(Y)
440 RETURN
```

HARDWARE REVUE by R.M. Heuser... The Computer Ear, manufactured by Andersen Research and Design, 1611 Lacota Lane. Burnsville MN 55337.price $49.95

The Computer Ear is a speech recognition input device for the Bally Arcade. The unit consists of a microphone and electronics which produces a signal which is then fed into the #4 port via an optical coupler, and digitized and stored in the Bally. Several different speech inputs may be stored by this method and later be compared to a real time input and be deciphered. If a comparison is made, a signal is produced by the software which can be used in a program.

As speech recognition units are not an exact science, this unit is not a finished product but its potentialities are vast for the person who wants to experiment. The documentation provided is excellent in regard to to the use of the unit. The exact values used for the parameters in the programs must be arrived at by experimentation using the Computer Ear and the software provided.

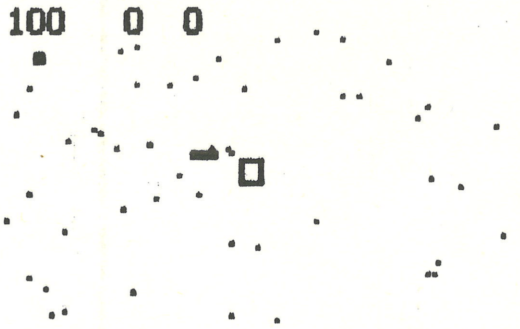
The Computer Ear is well designed mechanically as well as electrically and I think that the unit is a good buy for those of you who want to experiment with speech recognition.

TUTORIAL REVUE by R.M. Heuser... DMA GRAPHICS by C.J. Anderson is a tutorial on Direct Memory Addressing (DMA) when using graphics on the Bally Arcade. This tutorial discusses the use of DMA in producing outstanding graphics. It includes several programs and a table to use in making up graphic blocks to produce graphics and animation. This tutorial would be a great help to those programmers and innovators who don't know how to do these graphic routines. This tutorial can be ordered from Andersen Research and Design, 1611 Lacola Lane, Burnsville, MN 55337 for $3. to cover duplication and mailing costs. To those who order this tutorial, please send in some of your finished routines or make them available to ARCADIANs on tape.

BOWL-A-RAMA requires a small change in line 1180 to allow the third strike in a tenth frame to take place, reports Al Rathmell. Update P just before the last command by making the latter part of the line read:

```
IF F = 11 P = P + 1; GOTO 1300
```

BLACK HOLE (p.50) Apologies are in order as I didn't realize that there was no credit given to Ron Picardi as the author of this game. The object of the game is to achieve orbit around the mystery ship with the X and Y thruster control that you have. You should be at the same speed and distance from the Black Hole as the mystery ship, says Ron.



```
 2 .
 3 .
 4 .DOT GENERATOR
 5 .FOR TV CONVERGENCE
 6 .BY JAY FOWLER
10 CLEAR ;BC=0;FC=124
20 FOR Y=87TO 0STEP -10
30 FOR X=159TO 0STEP -8
40 BOX 0,0,X,Y,3
50 NEXT X;NEXT Y
```

Ads

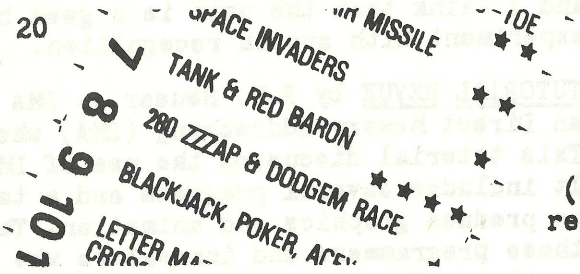
FOR SALE: Bally Arcade with STAR BATTLE, BASEBALL, FOOTBALL, MATH, LETTER MATCH, PANZER ATTACK, SEAWOLF, CLOWNS & BASIC cartridges and Cassette Interface. $400 or best offer. John Jacobson, Drawer F, Summersville, WV 26651 304-872-5994

SUPER SOFTWARE by Rob Rosenhouse. Space games, gambling games and much more. Write for program descriptions and free 'RND ART' program. 44 Forest Brook Dr. North Plainfield, NJ 07060

Checkers, ChessBoard, Hangman, Bowling, Bally's Alley (an adventure program) O-hello, Inspector Clue-so, Decode are the games available from John Collins, 713 Bradford Dr., Ft. Walton Beach, FL 32548, costing: $6 per program, $8 for two, $9 for three, or $10 for four, all on his tape. More data, listing info, etc., for an SAE

Dick Houser 635 Los Alamos Ave Livermore, CA 94550 is interested in putting out a free yearly catalog of software and hardware for the Bally, to besent to all known owners. The catalog would contain a description of the program or hardware, manufacturer's address, and prices. If interested in purchasing space in this catalog, call Dick at 415-447-8493, evenings.

EDGE TAGS for VIDEOCADES - a set of 20 sticky-back labels to be applied to the backside of the 'cades so that you can see the contents when they are in the storage slots. Includes indicator for number of players. $2.95/set. VIDEOCADE TAGS 304 NE 55th Portland OR 97213



(somewhat reduced)

George Collins 30 Sierra Ave., Piedmont CA 94611 has INVASION $5., BUG $5., and DEEPSPACE 2050 $10. including listings, modifications, and instructions. Send for descriptive literature.

W & W Software Sales 6594 Swartout Rd. Algonac MI 48001 report that they have added a new tape to their line, making nine total. (five programs per tape)

ARCADIAN

Robert Fabris, musician
3626 Morrie Dr.
San Jose, CA 95127